CS 592 REQUIREMENTS DEVELOPMENT

MAY-INTERIM 2020

Department of Computer Science and Information Systems
Bradley University

Basic Course Information:

- **Course Number:** CS 592
- **Course Name:** Requirements Development
- **Section Number:** 01
- **Number of Credits:** 3 credits
- **Catalog Description:** Covers topics including basic concepts and principles of software requirements engineering, the requirements engineering process – requirements elicitation, requirements analysis, requirements specification, system modeling, requirements validation and requirements management, and techniques, methods & tools for requirements engineering and software systems requirements modeling (including structured, object-oriented and formal approaches to requirements modeling and analysis).
- **Course Prerequisites:** A grade of C or better in CS102 or equivalent.
- **Course Homepage:** https://sakai.bradley.edu/

Course Objectives:

The objective of this course is to understand (1) the basic concepts and principles of software requirements engineering, (2) the requirements engineering process – requirements elicitation, requirements analysis, requirements specification, system modeling, requirements validation & requirements management, (3) techniques, methods and tools for requirements engineering, and (4) techniques, methods and tools for modeling software systems requirements including structured, objected-oriented and formal approaches to requirements modeling and analysis.

Instructor:

- **Name & Title:** Young Park, Professor of Computer Science
- **Office Location:** Bradley Hall 175
- **Office Hours:** Via Email & Sakai!
- **Contact Information:** Telephone: (309) 677-2457, Fax: (309) 677-2330, E-mail: young@bradley.edu, Homepage: http://hilltop.bradley.edu/~young, Mailing address: Dept. of Computer Science and Information Systems, Bradley University, 1501 West Bradley Avenue, Peoria, Illinois 61625

Class Meeting Location, Days & Times:

ARR

Course Materials:

- **Handouts (Required)** - papers, articles & documents!

- **Textbook & notes (Optional & Recommended):**

  - P. Laplante, *Requirements Engineering for Software and Systems*, Auerbach Publications, 2017. (ISBN: 9781138196117)
  - K. Wiegers & J. Beatty, *Software Requirements*, Microsoft Press, 3 edition, 2013. (ISBN: 0735679665)
  - *G. Kotonya & I. Sommerville, Requirements Engineering Processes and Techniques, John Wiley & Sons, 1998.* (ISBN: 0-471-97208-8)

- **Recommended Books**:
  - I. Bray, An Introduction to Requirements Engineering, Addison-Wesley, 2002.
  - B. A. Nuseibeh and S. M. Easterbrook, "Requirements Engineering: A Roadmap"
    In A. C. W. Finkelstein (ed) "*The Future of Software Engineering* ". (Companion volume to the proceedings of the ICSE'00).
  - D. Leffingwell & D. Widrig, *Managing Software Requirements – A Unified Approach*, Addison Wesley Longman, 2000.
  - R. Thayer & M. Dorfman, *Software Requirements Engineering*, IEEE Computer Society, 2000.
  - S. Robertson & J. Robertson, *Mastering the Requirements Process*, ACM Press, 1999.
  - K. Wiegers, *Software Requirements*, Microsoft Press, 1999.
  - I. Sommerville & P. Sawyer, *Requirements Engineering – A Good Practice Guide*, John Wiley & Sons, 1997.
  - L. Macaulay, *Requirements Engineering*, Springer-Verlag, 1996.
  - S. Andriole, *Managing Systems Requirements – Methods, Tools and Cases*, McGraw-Hill, 1996.
  - M. Jackson, *Software Requirements & Specifications: A Lexicon of Practice*, Principles, and Prejudices, Addison-Wesley, 1995.
  - P. Loucopoulos & V. Karakostas, *System Requirements Engineering*, McGraw-Hill, 1995.
  - A. Davis, *Software Requirements – Objects, Functions & States*, Prentice Hall PTR, 1993.
  - D. Gause and G. Weinberg, *Exploring Requirements: Quality before Design*. Dorset House, 1989.
  - I. Jacobson, G. Booch & J. Rumbaugh, *The Unified Software Development Process*, Addison-Wesley Longman, 1999.

- I. Jacobson, G. Booch & J. Rumbaugh, *The Unified Modeling language - User Guide*, Addison-Wesley Longman, 1999.
- J. Rumbaugh, I. Jacobson & G. Booch &, *The Unified Modeling language – Reference Manual*, Addison-Wesley Longman, 1999.
- P. Kruchten, *The Rational Unified Process – An Introduction*, Addison-Wesley Longman, 2000.
- T. Quatrani, *Visual Modeling with Rational Rose 2000 and UML*, Addison-Wesley Longman, 2000.
- M. Fowler, *UML Distilled*, Addison-Wesley Longman, 2000.
- G. Schneider & J. Winters, *Applying Use Cases – A Practical Guide*, Addison-Wesley Longman, 1998.
- J. Conallen, *Building Web Applications with UML*, Addison-Wesley Longman, 2000.

- **Recommended Magazines, Journals & Conferences**:
  - RESG (The Requirements Engineering Specialist Group) of The British Computer Society http://www.resg.org.uk/
  - RE sources http://www.resg.org.uk/html/links.html
  - IEEE Computer
  - ACM CACM (Communications of the ACM)
  - IEEE Software
  - IEEE Transactions on Software Engineering
  - The Requirements Engineering Journal
  - The Annals of Software Engineering
  - International Symposium on Requirements Engineering (ISRE).
  - International Conference on Requirements Engineering (ICRE).
  - International Conference on Software Engineering (ICSE).
  - European Software Engineering Conference (ESEC).

Course Requirements:

- **Class attendance, participation & presentation**
- **Projects:** Research & tool project & Requirements development project (to collect, prototype, model, specify and verify the requirements for a software system)
- **Exams:** Final exam

Grading:

The raw score (total: 1000 points) will be based on

- **Class attendance, participation & presentation:** 150 points
- **Research & Tool project:** 200 points
- **Requirements Development project:** 350 points
- **Final exam:** 300 points

The final letter grade will be given from the raw score based on the following conversion rule (**Tentative and subject to be adjusted depending on the distribution of the raw scores of the class**):

Letter Grade	Raw Score Range
A	900 < raw-score ≤ 1000
B	800 < raw-score ≤ 900
C	700 < raw-score ≤ 800
D	600 < raw-score ≤ 700
F	0 ≤ raw-score ≤ 600

Course Policies:

- **Academic Honesty:** Anyone found cheating on any graded project and examination will receive an F for this course and other further action will be taken.
- **Attendance & Preparation:** Lecture attendance is mandatory and students are expected to come well prepared for every class. Notetaking is highly encouraged to help understand ideas more deeply.
- **Assignment Submission:** All projects must be handed in at the beginning of the class on the due date and in envelopes.
- **Late Policy:** No late submission of projects without a note from your doctor or your employer is accepted.
- **Makeup & Incomplete:** Makeup work and incompletes are only given in unusual circumstances, and only when work has been completely satisfactorily up to the point when the incomplete was requested.

Course Content & Schedule:

(**Tentative and subject to change**)

Date	Topics	Readings
5/18	Course Information Requirements, Requirements Engineering, The Requirements Documents	
5/19	Requirements Engineering	**Topic RE1:** *Requirements Engineering: A Roadmap*

5/20	Software Requirements	**Topic RE2:** *Software Requirements: A Tutorial*
5/21	RD Project: Customer Description of the System - Presentation, Discussion & Evaluation	
5/22	Software Requirements	**Topic RE3:** *Software Requirements - Chapter 1: SWEBOK*
5/22	Certified Professional for Requirements Engineering	**Topic RECertification:** *IREB Certified Professional for Requirements Engineering*
5/23	Getting Requirements	**Topic REPractice:** *Getting Requirements Right Examples* & *Getting Requirements Right Tips*
5/23	Requirements Engineering Tools	**Topic RETool:** *Requirements Engineering Tools*
5/25	UML & Use Case-based Requirements	**Topic UML:** *UML: An Overview* **Topic UCModeling1:** *Use Case-based Requirements*
5/25	Use Cases & Deriving Development with Use Cases	**Topic UCModeling2:** *Use Cases: An Introduction* & *Driving Development with Use Cases*
5/26	Research/Tool Project: Progress Report - Presentation, Discussion & Evaluation	
5/27	RD Project: Progress Report - Presentation, Discussion & Evaluation	
5/28	Concept of Operations (ConOps) Document	**Topic RDocument1:** *Concept of Operations (ConOps) Document*
5/28	Software Requirements Specification (SRS)	**Topic RDocument2:** *Software Requirements Specification (SRS)*

5/29	Vision Document & Modern SRS Package	**Topic RDocument3:** *Vision Document* & *Modern SRS Package*
5/29	Non-Functional Requirements	**Topic NFR**: ***Non-Functional Requirements***
6/1	Formal Specification	**Topic FS:** *Formal Specification: A Roadmap* & *Z*
6/1	Future of Requirements Engineering	**Topic REFuture:** *Future of Requirements Engineering*
6/2	Research/Tool Project: Final Report,- Presentation, Discussion & Evaluation	
6/3	RD Project: Final Report - Presentation, Discussion & Evaluation	
6/4	Course Review and Summary Topics to study for final exam	
6/5	**Final Exam**	

*** End of CS592 Course Information ***